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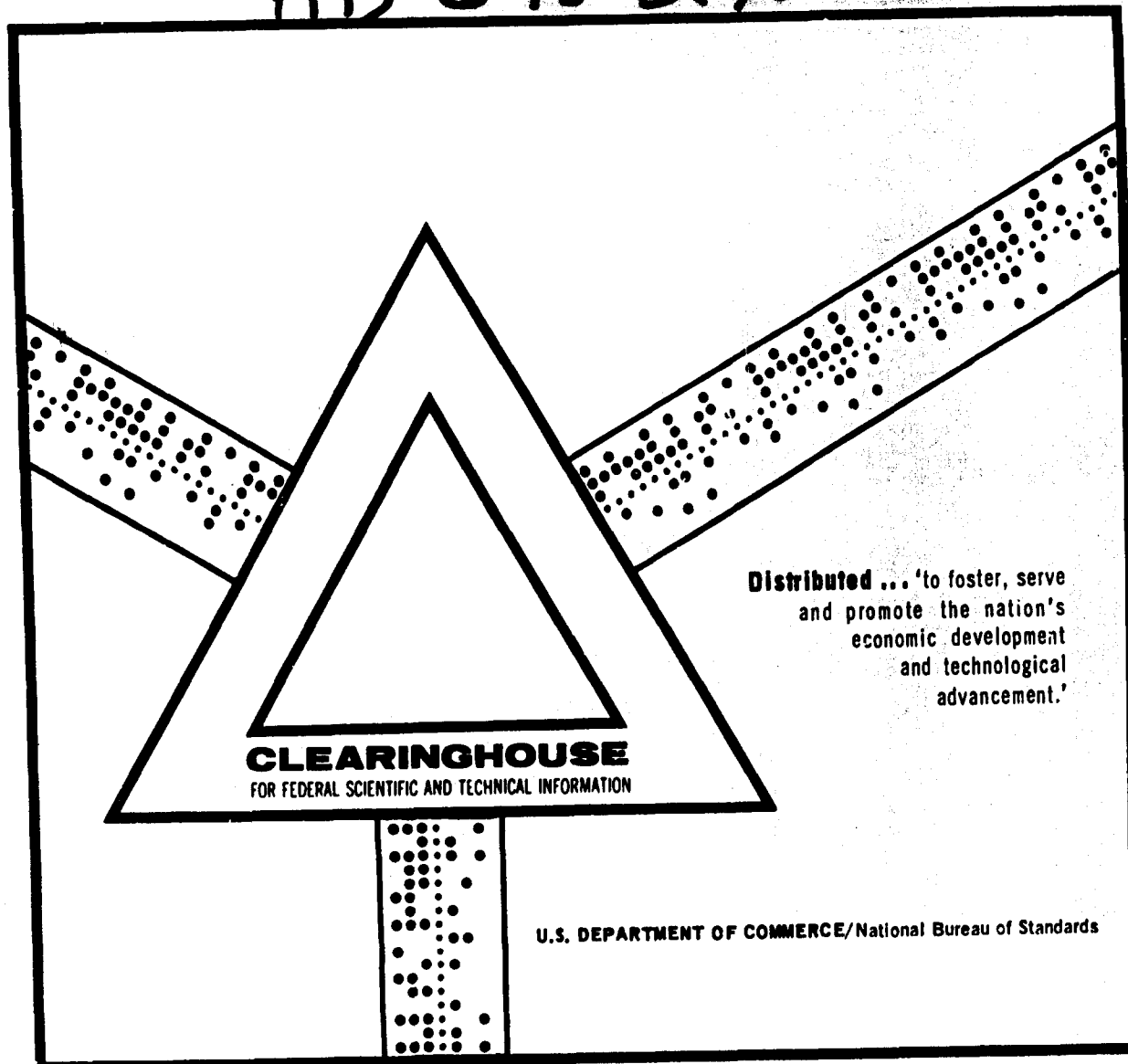
CIVILIAN SCIENTISTS AND ENGINEERS IN ARMY,  
NAVY AND AIR FORCE RDT/E

E. M. Glass

Office of the Director of Defense Research and  
Engineering  
Washington, D. C.

1 September 1969

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CIVILIAN SCIENTISTS AND ENGINEERS  
IN ARMY, NAVY AND AIR FORCE RDT&E

by

E. M. Glass  
Assistant Director

1 September 1969

Management Analysis Report 69-5  
Office for Laboratory Management  
Office of the Director of Defense Research and Engineering  
Washington, D. C. 20301

## INTRODUCTION

After the publication of MAR 69-1, *Profile of Civilian Scientists and Engineers in Field Activities of the Department of Defense*, dated 1 July 1969, there were many requests for similar data by individual military department and for a profile of scientists and engineers (S&E) in uniform. This report compares the S&E civilian work force of the three military departments with the DoD composite. A separate report, MAR 69-6, *Profile of Military Scientists and Engineers*, which has been completed and will soon be issued, characterizes the military scientists and engineers assigned to DoD field research, development, test and evaluation (RDT&E) activities.

This summary is based upon a survey of the S&Es in field RDT&E activities of the Department of Defense—primarily laboratories, test centers and ranges. These activities do not include headquarters or system project offices. The information was provided by individual scientists and engineers and was forwarded by the organizations involved to the Office for Laboratory Management, Office of the Director of Defense Research and Engineering. The effective date of the information is 1 September 1968.

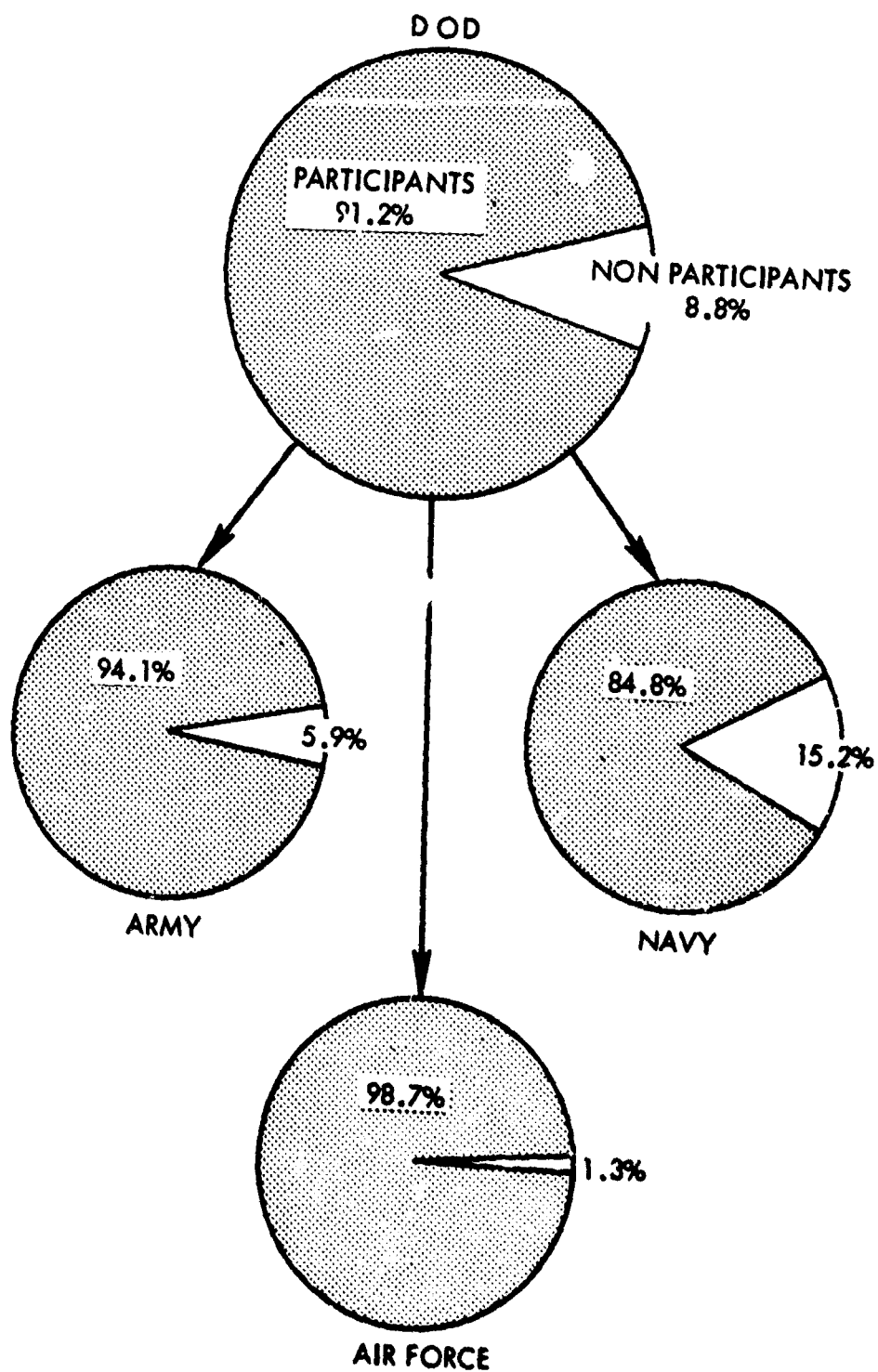
Programing support was provided by the U.S. Air Force's OSD Information Systems Division, chiefly by Spec. 4 Richard Hein. Beth R. King furnished editorial assistance, and the graphic arts work was done by Robert B. Logan and his associates of the Graphics and Presentations Branch, Office of the Assistant Secretary of Defense (Administration).

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## PARTICIPATION IN THE SURVEY

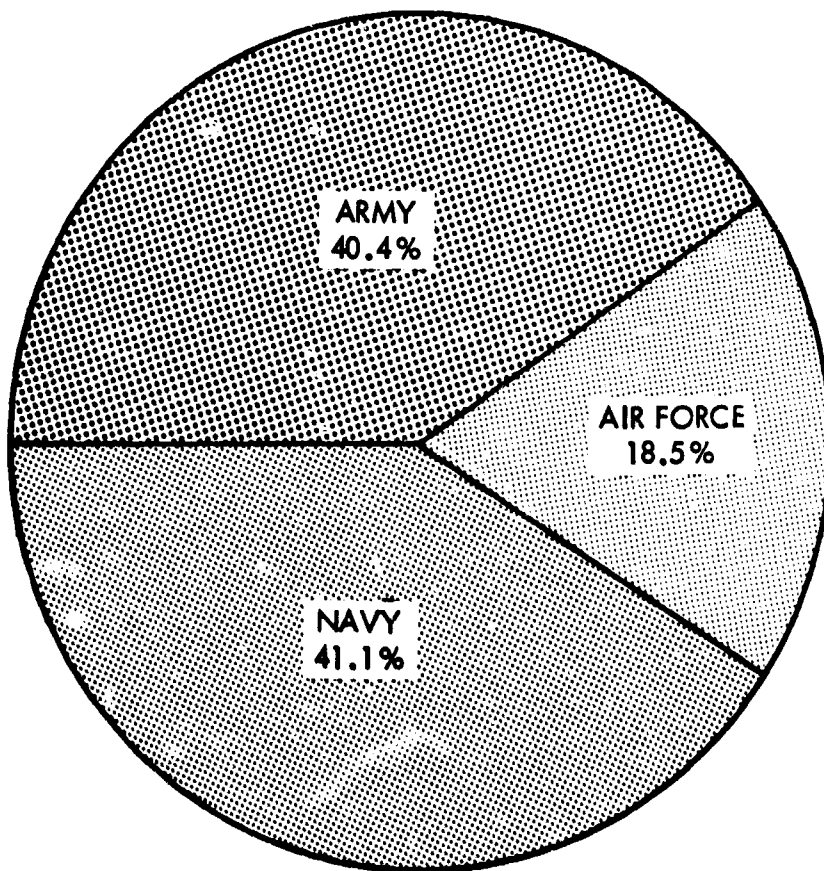
The information for this survey was provided by 26,437 civilian employees of the Department of Defense. The Air Force has the highest participation, and the Navy, the lowest.



### Distribution by Military Department

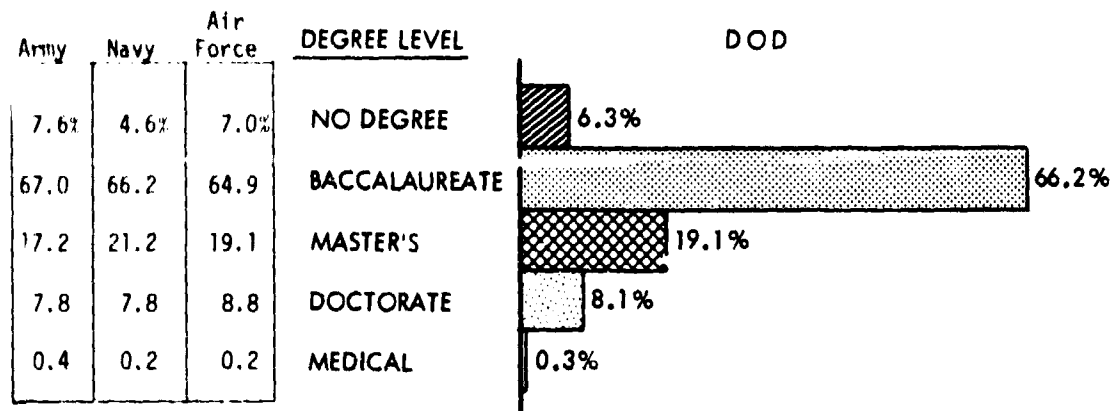
The Army and Navy, the largest subsets of the sample, are almost equal in size. The size of the Air Force is less than half that of the others.

|           | <u>No. of S&amp;Es</u> | <u>% of Total</u> |
|-----------|------------------------|-------------------|
| Army      | 10,680                 | 40.4              |
| Navy      | 10,872                 | 41.1              |
| Air Force | 4,885                  | 18.5              |



### EDUCATIONAL LEVELS

Of the total sample of S&E professionals, 93.7 percent have at least baccalaureate degrees; this varies from 95.4 percent for the Navy to 92.4 percent for the Army. Those with advanced degrees range from 25.4 percent for the Army to 29.2 percent for the Navy.



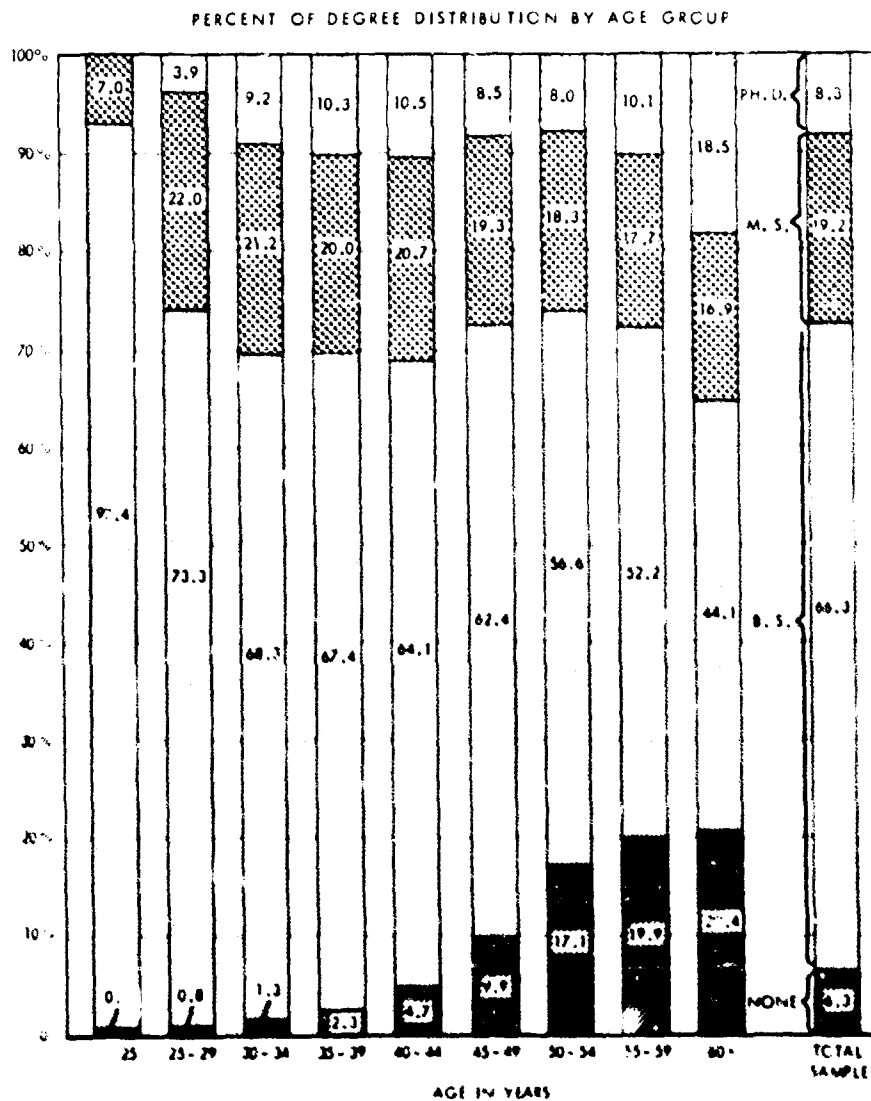
### PERCENTAGE OF DOD TOTAL

| Department | No degree | B.S. | M.S. | Doctorate | Medical | Total |
|------------|-----------|------|------|-----------|---------|-------|
| Army       | 48.7      | 40.8 | 36.2 | 39.5      | 65.8    | 40.4  |
| Navy       | 30.6      | 41.1 | 45.4 | 40.2      | 23.2    | 41.1  |
| Air Force  | 20.7      | 18.1 | 18.4 | 20.3      | 11.0    | 18.5  |

### Age

The percentage of no-degree professionals increases with increasing age. The converse is true of those with Bachelor's degrees. M.S. personnel are evenly distributed over most age groups. This is also the case with Ph.D.'s, except for the relatively high representation in the age group 60-plus.

|           | <u>Doctorates</u>                       |                            |
|-----------|---|----------------------------|
|           | <u>% of all S&amp;Es<br/>at age 60+</u> | <u>% of all doctorates</u> |
| Army      | 16.4                                    | 9.1                        |
| Navy      | 21.8                                    | 6.7                        |
| Air Force | 19.6                                    | 8.6                        |





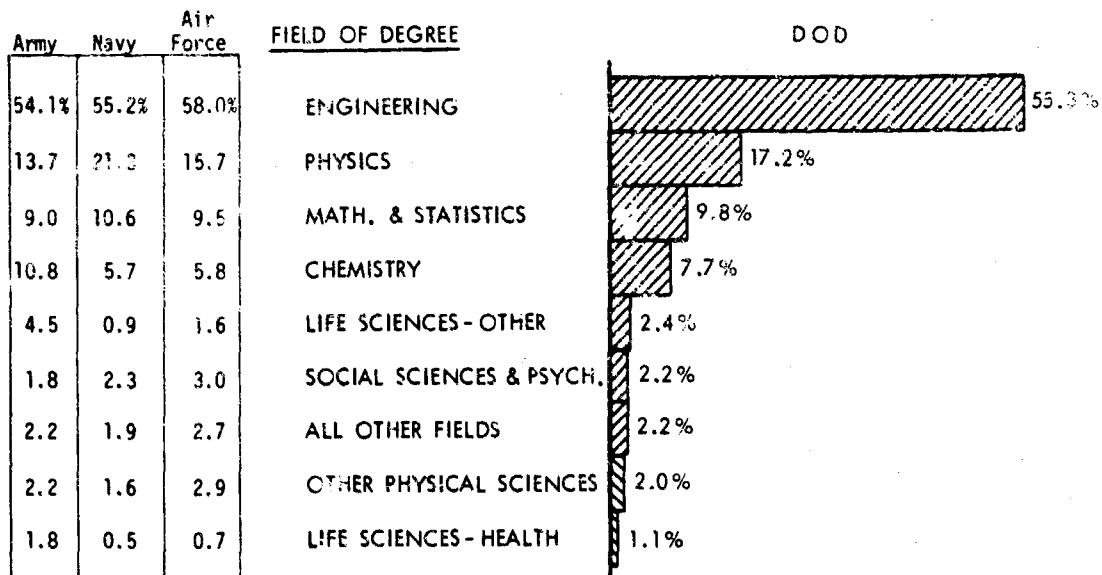
## AGE (continued)

| Degree Level | Department       |       |       |       |       |       |       |       |      |      |  | Total |
|--------------|------------------|-------|-------|-------|-------|-------|-------|-------|------|------|--|-------|
|              |                  |       |       |       |       |       |       |       |      |      |  |       |
|              | <u>Army</u>      |       |       |       |       |       |       |       |      |      |  |       |
| No degree    | 0.3              | 1.8   | 1.3   | 2.8   | 4.0   | 10.8  | 17.9  | 23.0  | 23.2 | 7.6  |  |       |
| B.S.         | 94.1             | 77.7  | 73.2  | 69.3  | 65.9  | 60.7  | 56.3  | 52.5  | 44.9 | 67.0 |  |       |
| M.S.         | 5.6              | 16.3  | 16.8  | 18.4  | 19.4  | 20.1  | 17.3  | 15.3  | 15.4 | 17.1 |  |       |
| Doctorate*   | --               | 4.1   | 8.2   | 9.4   | 10.7  | 8.4   | 8.5   | 9.1   | 16.4 | 8.3  |  |       |
|              | <u>Navy</u>      |       |       |       |       |       |       |       |      |      |  |       |
| No degree    | 0.5              | 0.3   | 1.0   | 2.0   | 4.8   | 9.0   | 15.8  | 14.7  | 13.0 | 4.7  |  |       |
| B.S.         | 91.6             | 68.4  | 64.9  | 66.4  | 62.1  | 63.0  | 56.4  | 53.7  | 46.3 | 66.1 |  |       |
| M.S.         | 7.9              | 27.3  | 24.9  | 20.9  | 21.7  | 19.6  | 19.8  | 20.2  | 18.9 | 21.2 |  |       |
| Doctorate*   | 0.1              | 3.9   | 9.0   | 10.7  | 11.4  | 8.5   | 8.0   | 11.4  | 21.8 | 8.0  |  |       |
|              | <u>Air Force</u> |       |       |       |       |       |       |       |      |      |  |       |
| No degree    | 1.6              | 0.2   | 0.8   | 1.8   | 6.5   | 9.7   | 17.5  | 22.2  | 23.8 | 7.0  |  |       |
| B.S.         | 91.9             | 80.6  | 65.1  | 66.1  | 63.4  | 64.5  | 57.9  | 48.7  | 38.6 | 64.9 |  |       |
| M.S.         | 6.5              | 16.0  | 22.6  | 21.1  | 21.8  | 16.9  | 17.5  | 18.9  | 18.0 | 19.1 |  |       |
| Doctorate*   | --               | 3.2   | 11.4  | 11.0  | 8.4   | 8.3   | 7.0   | 10.2  | 19.6 | 9.0  |  |       |
| Age (yr)     | <25              | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60+  |      |  |       |

Note: \*Includes M.D., D.D.S and D.V.M degrees.

### Field of Highest Degree

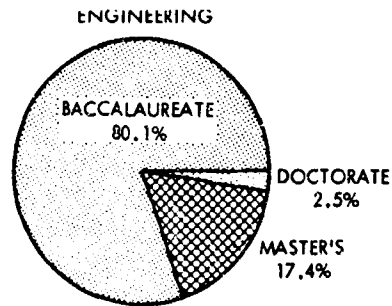
Engineers represent the largest proportion of the sample at 55.3 percent. The range of the Services is 3.9 percentage points, from Army at 54.1 percent to Air Force at 58.0 percent. The Navy employs the greatest number of physicists, while the Army has the highest percentage of chemists and life scientists.



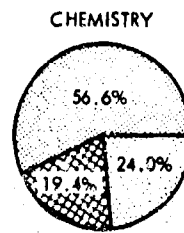
## Degree Levels Attained in the Various Fields

Engineering shows the lowest relative numbers of advanced-degree holders. The largest percentage of doctorates and advanced degrees is in the life sciences, with chemistry second. Mathematics and statistics display distributions similar to those of engineering.

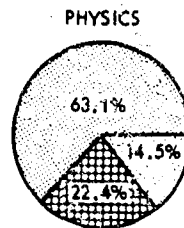
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| B.S. | 82.5% | 77.5% | 81.2%     | 80.1% |
| M.S. | 15.3  | 19.8  | 16.1      | 17.4  |
| Doc. | 2.2   | 2.7   | 2.6       | 2.5   |



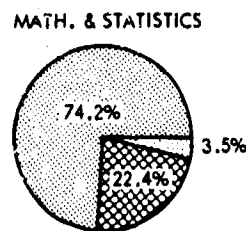
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| B.S. | 61.6% | 50.0% | 52.6%     | 56.6% |
| M.S. | 19.8  | 19.1  | 19.2      | 19.4  |
| Doc. | 18.6  | 30.9  | 28.2      | 24.0  |



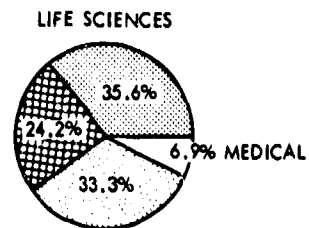
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| B.S. | 66.1% | 62.4% | 60.5%     | 63.1% |
| M.S. | 20.9  | 22.7  | 23.3      | 22.4  |
| Doc. | 13.0  | 14.9  | 16.2      | 14.5  |



|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| B.S. | 77.4% | 71.0% | 77.0%     | 74.2% |
| M.S. | 20.5  | 25.5  | 18.0      | 22.4  |
| Doc. | 2.1   | 3.5   | 5.0       | 3.5   |

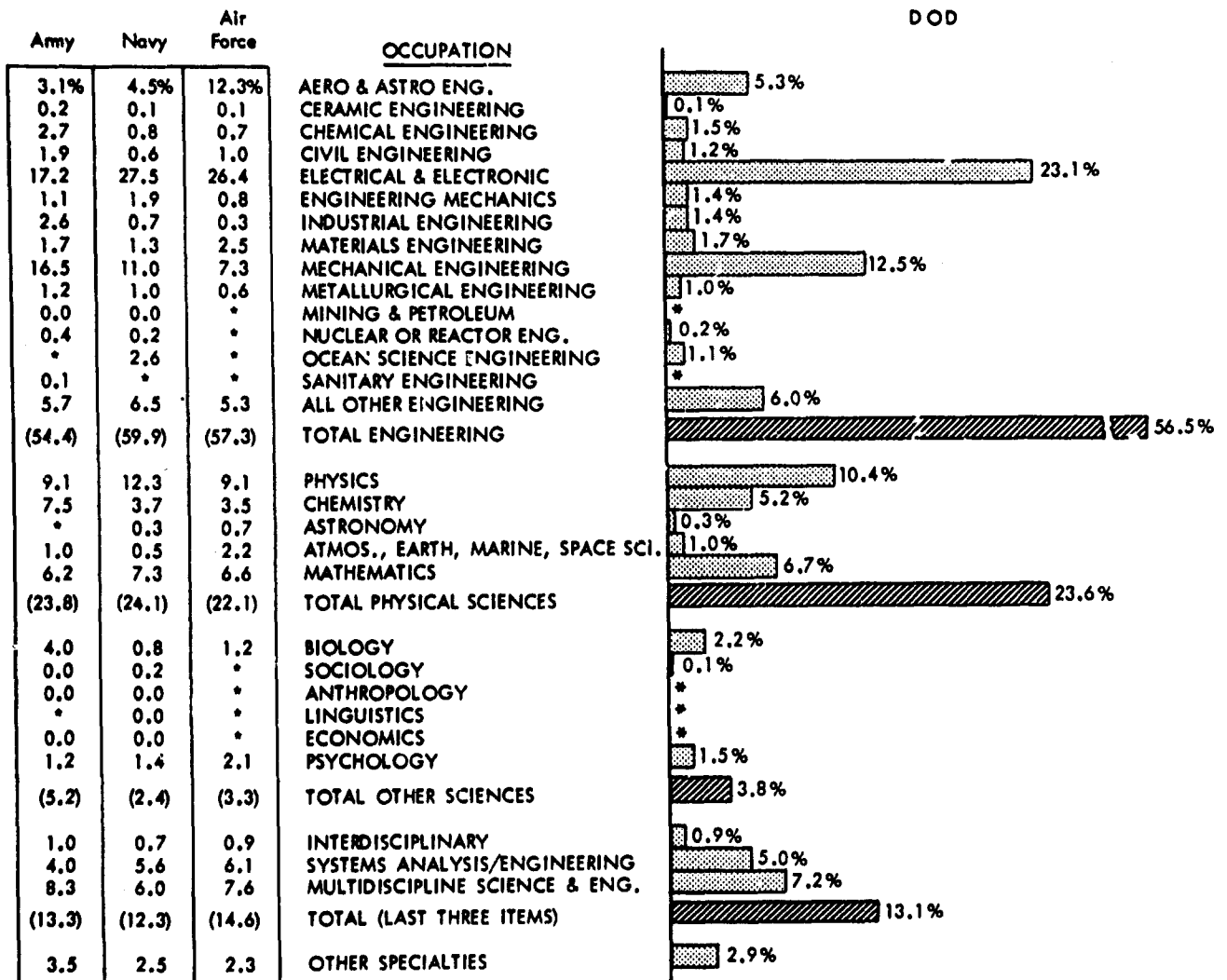


|       | Army  | Navy  | Air Force | DoD   |
|-------|-------|-------|-----------|-------|
| B.S.  | 37.0% | 33.0% | 30.9%     | 35.6% |
| M.S.  | 23.2  | 29.1  | 23.5      | 24.2  |
| Ph.D. | 33.1  | 29.1  | 40.0      | 33.3  |
| Med.  | 6.7   | 8.8   | 5.6       | 6.9   |



## OCCUPATIONS

The Army has the highest percentages of chemical and mechanical engineers, chemists and biologists. The Navy exceeds in electrical and electronics engineers, ocean-science engineers, physicists and mathematicians. The Air Force employs the greatest proportion of aeronautical and astronautical engineers, materials engineers and psychologists..



\* 13 OR FEWER DOD S&E PROFESSIONALS

# TECHNICAL MOBILITY

The primary work activity is compared here to the field of highest degree. A significant number of scientists and engineers identify themselves with fields other than those in which they received their academic training. This compilation does not include persons having no degree.

FIELD OF HIGHEST DEGREE VS. PRIMARY WORK ACTIVITY  
(Cell percent is based on column sum.)

| Primary work activity                      | Field of Highest Degree |               |               |                         |   |             |                                |                            |                  | Total  | Percentage |
|--|-------------------------|---------------|---------------|-------------------------|---|-------------|--------------------------------|----------------------------|------------------|--------|------------|
|  | Engineering             | Chemistry     | Physics       | Other physical sciences | Life sciences<br>(Health-related) (Other) |             | Social and behavioral sciences | Mathematics and statistics | All other fields |        |            |
| Aeronautical and astronautical engineering | 9.1<br>1,247            | 0.6<br>11     | 1.2<br>52     | 0.6<br>3                | --<br>--                                  | 0.2<br>1    | 0.5<br>3                       | 1.3<br>32                  | 3.1<br>15        | 1,364  | 5.5        |
| Chemical engineering                       | 2.1<br>293              | 4.4<br>85     | 0.2<br>8      | 0.2<br>1                | 0.4<br>1                                  | 0.3<br>2    | --<br>--                       | 0.1<br>3                   | 1.0<br>5         | 298    | 1.6        |
| Electrical and electronic engineering      | 33.4<br>4,573           | 1.9<br>36     | 14.9<br>636   | 4.4<br>22               | 2.6<br>7                                  | 0.5<br>3    | 3.1<br>17                      | 5.0<br>122                 | 11.1<br>53       | 5,469  | 22.2       |
| Mechanical engineering                     | 20.5<br>2,895           | 1.1<br>21     | 1.7<br>73     | 3.0<br>15               | 0.4<br>1                                  | 0.5<br>3    | 0.9<br>5                       | 1.4<br>35                  | 8.6<br>41        | 2,999  | 12.1       |
| Nuclear and reactor engineering            | 0.2<br>27               | 0.6<br>11     | 0.4<br>15     | 0.2<br>1                | 0.4<br>1                                  | --<br>--    | --<br>--                       | 0.1<br>3                   | 0.2<br>1         | 59     | 0.2        |
| Other engineering                          | 23.9<br>3,267           | 10.3<br>197   | 12.4<br>531   | 23.4<br>118             | 3.8<br>10                                 | 5.6<br>34   | 4.9<br>27                      | 14.5<br>350                | 25.1<br>120      | 4,645  | 18.8       |
| Physics and astronomy                      | 1.2<br>165              | 4.1<br>78     | 54.1<br>2,309 | 13.5<br>68              | 1.5<br>4                                  | 0.3<br>2    | 0.2<br>1                       | 3.9<br>94                  | 5.0<br>24        | 2,745  | 11.1       |
| Chemistry                                  | 0.3<br>37               | 61.4<br>1,187 | 0.3<br>11     | 3.6<br>18               | 9.8<br>26                                 | 8.6<br>52   | --<br>--                       | 0.2<br>5                   | 2.3<br>11        | 1,347  | 5.5        |
| Atmosphere and space sciences              | 0.1<br>15               | 0.3<br>6      | 1.7<br>72     | 24.8<br>125             | --<br>--                                  | 0.3<br>2    | 1.5<br>8                       | 0.4<br>10                  | 1.9<br>9         | 247    | 1.0        |
| Biology and agriculture                    | 0.0<br>1                | 0.5<br>9      | 0.0<br>1      | 0.4<br>2                | 55.1<br>146                               | 63.3<br>383 | 0.4<br>2                       | 0.1<br>2                   | 2.3<br>11        | 557    | 2.3        |
| Social and behavioral sciences             | 0.0<br>1                | --<br>--      | 0.0<br>1      | 0.2<br>1                | --<br>--                                  | 1.2<br>7    | 73.1<br>399                    | 0.1<br>3                   | 2.1<br>10        | 422    | 1.7        |
| Mathematics and statistics                 | 0.2<br>34               | 0.5<br>10     | 1.5<br>65     | 3.2<br>16               | 0.8<br>2                                  | 0.5<br>3    | 2.6<br>14                      | 63.7<br>1,543              | 8.8<br>42        | 1,729  | 7.0        |
| Other specialties                          | 8.9<br>1,215            | 13.9<br>267   | 11.6<br>497   | 22.8<br>115             | 25.3<br>67                                | 10.7<br>113 | 12.0<br>70                     | 9.1<br>220                 | 28.5<br>136      | 2,700  | 10.9       |
| Percentage                                 | 55.4                    | 7.8           | 17.3          | 2.0                     | 1.1                                       | 2.5         | 2.2                            | 9.8                        | 1.9              |        | 100.0      |
| Total                                      | 13,680                  | 1,918         | 4,271         | 505                     | 265                                       | 605         | 546                            | 2,422                      | 478              | 24,690 |            |

## TECHNICAL MOBIL

| Occupation                     | FIELD OF HIGHEST DEGREE |      |      |           |      |      |         |      |      |                         |      |      |        |
|--------------------------------|-------------------------|------|------|-----------|------|------|---------|------|------|-------------------------|------|------|--------|
|                                | Engineering             |      |      | Chemistry |      |      | Physics |      |      | Other Physical Sciences |      |      | Health |
|                                | A                       | N    | AF   | A         | N    | AF   | A       | N    | AF   | A                       | N    | AF   | A      |
| Engineering:                   |                         |      |      |           |      |      |         |      |      |                         |      |      |        |
| Aeronautical and astronautical | 5.0                     | 7.7  | 20.5 | 0.7       | 0.5  | 0.4  | 1.1     | 1.0  | 2.1  | 0.9                     | --   | 0.8  | --     |
| Chemical                       | 3.9                     | 1.1  | 0.9  | 5.8       | 2.6  | 2.7  | 0.4     | 0.0  | 0.3  | 0.5                     | --   | --   | 0.6    |
| Electrical and electronic      | 26.2                    | 40.3 | 33.0 | 1.2       | 2.0  | 4.2  | 9.2     | 16.0 | 22.3 | 3.3                     | 5.0  | 5.3  | 0.6    |
| Mechanical                     | 26.6                    | 18.8 | 11.8 | 1.4       | 1.0  | --   | 3.7     | 0.8  | 0.7  | 4.7                     | 2.5  | 0.8  | --     |
| Nuclear                        | 0.3                     | 0.2  | 0.1  | 0.8       | 0.3  | --   | 0.7     | 0.3  | --   | 0.5                     | --   | --   | --     |
| Other                          | 25.4                    | 23.5 | 21.7 | 7.7       | 13.1 | 14.4 | 9.6     | 16.0 | 5.7  | 19.2                    | 38.5 | 11.5 | 2.8    |
| Physics and astronautics       | 1.0                     | 1.2  | 1.7  | 2.5       | 4.8  | 8.7  | 58.4    | 52.9 | 49.4 | 6.1                     | 18.0 | 19.8 | 1.1    |
| Chemistry                      | 0.5                     | 0.1  | 0.1  | 64.0      | 61.5 | 54.4 | 0.3     | 0.3  | 0.1  | 3.8                     | 3.1  | 3.8  | 11.2   |
| Atmospheric and space sciences | 0.1                     | 0.1  | 0.3  | 0.2       | 0.2  | 1.1  | 1.6     | 1.0  | 3.8  | 22.5                    | 13.0 | 42.7 | --     |
| Biology and agriculture        | --                      | 0.0  | --   | 0.6       | --   | 1.1  | 0.1     | --   | --   | 0.9                     | --   | --   | 60.7   |
| Social and behavioral sciences | 0.0                     | --   | --   | --        | --   | --   | 0.1     | --   | --   | --                      | 0.6  | --   | --     |
| Mathematics and statistics     | 0.2                     | 0.2  | 0.3  | 0.6       | 0.7  | --   | 1.7     | 1.5  | 1.3  | 3.3                     | 5.0  | 0.8  | 0.6    |
| Other specialties              | 10.8                    | 6.8  | 9.5  | 14.5      | 13.3 | 12.9 | 13.2    | 10.2 | 13.3 | 34.3                    | 14.3 | 14.5 | 22.5   |
| Total                          | 5341                    | 5709 | 2630 | 1063      | 587  | 263  | 1353    | 2204 | 713  | 213                     | 161  | 131  | 178    |
| Percentage                     | 54.3                    | 55.3 | 58.1 | 10.8      | 5.7  | 5.8  | 13.8    | 21.3 | 15.7 | 2.2                     | 1.6  | 2.9  | 1.8    |

①

ANICAL MOBILITY (continued)

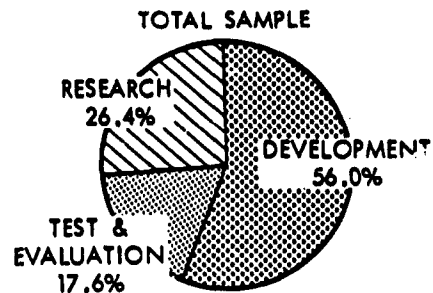
|                |      |      |       |      |      |                              |      |      | FIELD OF HIGHEST DEGREE  |      |      |                  |      |      |       |        |       |
|----------------|------|------|-------|------|------|------------------------------|------|------|--------------------------|------|------|------------------|------|------|-------|--------|-------|
| Life Sciences  |      |      |       |      |      | Social & Behavioral Sciences |      |      | Mathematics & Statistics |      |      | All Other Fields |      |      | Total |        |       |
| Health-Related |      |      | Other |      |      |                              |      |      |                          |      |      |                  |      |      |       |        |       |
| A              | N    | AF   | A     | N    | AF   | A                            | N    | AF   | A                        | N    | AF   | A                | N    | AF   | A     | N      | AF    |
| --             | --   | --   | 0.2   | --   | --   | 0.6                          | 0.8  | --   | 1.5                      | 0.7  | 2.5  | 2.1              | 0.6  | 8.6  | 3.2   | 4.6    | 12.7  |
| 0.6            | --   | --   | 0.5   | --   | --   | --                           | --   | --   | 0.2                      | --   | 0.2  | 1.1              | 1.1  | 0.9  | 2.9   | 0.8    | 0.8   |
| 0.6            | 9.4  | 3.0  | 0.5   | --   | 1.4  | 2.3                          | 2.5  | 5.2  | 3.8                      | 5.2  | 7.2  | 6.0              | 9.4  | 21.6 | 16.3  | 26.7   | 24.5  |
| --             | 1.9  | --   | 0.2   | --   | 2.7  | 1.7                          | 0.8  | --   | 2.8                      | 0.5  | 0.9  | 14.3             | 5.0  | 5.2  | 15.8  | 10.9   | 7.3   |
| --             | 1.9  | --   | --    | --   | --   | --                           | --   | --   | 0.2                      | 0.1  | --   | 0.5              | --   | --   | 0.4   | 0.2    | --    |
| 2.8            | 5.7  | 6.1  | 3.2   | 17.4 | 5.4  | 5.7                          | 5.1  | 3.7  | 15.2                     | 16.4 | 7.9  | 19.8             | 28.3 | 28.4 | 18.4  | 20.3   | 16.6  |
| 1.1            | 1.9  | 3.0  | 0.5   | --   | --   | 0.6                          | --   | --   | 3.6                      | 4.6  | 2.5  | 6.0              | 5.0  | 3.4  | 9.5   | 13.1   | 10.2  |
| 11.2           | 3.8  | 9.1  | 7.1   | 7.6  | 18.9 | --                           | --   | --   | 0.2                      | 0.2  | 0.2  | 3.8              | 1.1  | 1.7  | 7.9   | 3.8    | 3.8   |
| --             | --   | --   | 0.5   | --   | --   | 3.4                          | 0.8  | --   | 0.1                      | 0.4  | 1.2  | 3.8              | 0.6  | 0.9  | 0.9   | 0.5    | 2.2   |
| 60.7           | 32.1 | 63.6 | 66.5  | 62.0 | 45.9 | --                           | 0.4  | 0.7  | 0.1                      | 0.1  | --   | 4.9              | 1.1  | --   | 4.3   | 0.8    | 1.3   |
| --             | --   | --   | 0.9   | 1.1  | 2.7  | 70.9                         | 70.0 | 81.3 | 0.1                      | 0.2  | --   | 2.2              | 2.8  | 0.9  | 1.4   | 1.7    | 2.5   |
| 0.6            | 1.9  | --   | 0.7   | --   | --   | 3.4                          | 2.5  | 1.5  | 63.2                     | 63.7 | 64.9 | 7.7              | 8.3  | 11.2 | 6.4   | 7.6    | 6.9   |
| 22.5           | 41.5 | 15.2 | 19.4  | 12.0 | 23.0 | 11.4                         | 16.9 | 7.5  | 8.9                      | 7.9  | 12.5 | 27.5             | 36.7 | 17.2 | 12.8  | 9.1    | 11.1  |
| 178            | 53   | 33   | 439   | 92   | 74   | 175                          | 237  | 134  | 888                      | 1101 | 433  | 182              | 180  | 116  | 9832  | 10,324 | 4527  |
| 1.8            | 0.5  | 0.7  | 4.5   | 0.9  | 1.6  | 1.8                          | 2.3  | 3.0  | 9.0                      | 10.7 | 9.6  | 1.9              | 1.7  | 2.6  | 100.0 | 100.0  | 100.0 |

## FUNCTIONAL AREA

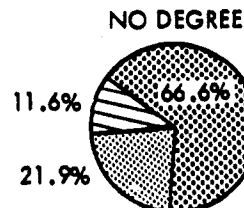
Over half of the S&E personnel are engaged in developmental activities. At least three-quarters of doctorate-level S&Es are engaged in research.

(DISTRIBUTION IN %)

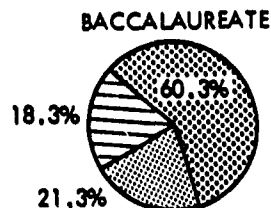
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| Res. | 28.1% | 28.1% | 25.6%     | 26.4% |
| Dev. | 56.0  | 53.6  | 56.7      | 56.0  |
| T&E  | 17.6  | 18.4  | 17.7      | 17.6  |



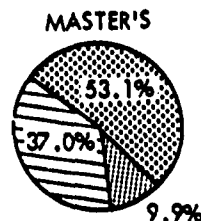
|      | Army  | Navy | Air Force | DoD   |
|------|-------|------|-----------|-------|
| Res. | 14.3% | 7.8% | 10.5%     | 11.6% |
| Dev. | 63.9  | 66.5 | 73.3      | 66.6  |
| T&E  | 21.8  | 25.7 | 16.3      | 21.9  |



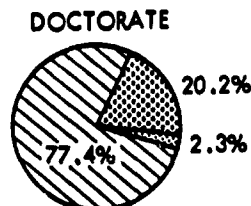
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| Res. | 20.6% | 17.7% | 14.7%     | 18.3% |
| Dev. | 57.3  | 60.3  | 67.1      | 60.3  |
| T&E  | 22.1  | 22.0  | 18.2      | 21.3  |



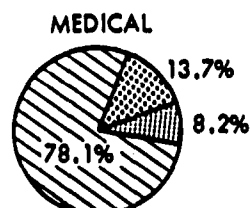
|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| Res. | 39.3% | 34.7% | 38.0%     | 37.0% |
| Dev. | 50.8  | 56.8  | 48.5      | 53.1  |
| T&E  | 9.9   | 8.6   | 13.4      | 9.9   |



|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| Res. | 77.7% | 76.7% | 78.4%     | 77.4% |
| Dev. | 19.8  | 21.2  | 19.5      | 20.3  |
| T&E  | 2.5   | 2.1   | 2.1       | 2.3   |



|      | Army  | Navy  | Air Force | DoD   |
|------|-------|-------|-----------|-------|
| Res. | 77.1% | 88.2% | 62.5%     | 78.1% |
| Dev. | 12.5  | 11.8  | 25.0      | 13.7  |
| T&E  | 10.4  | 0.0   | 12.5      | 8.2   |

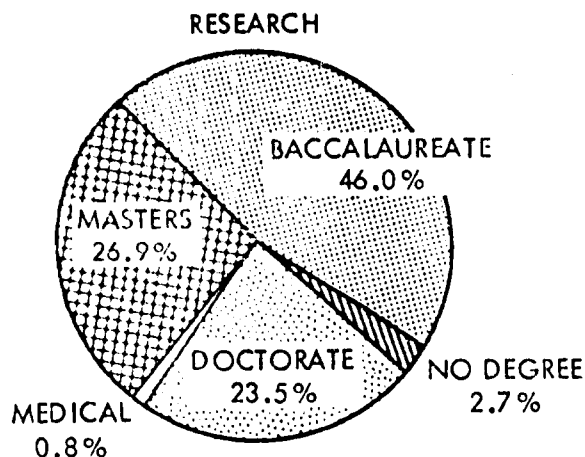




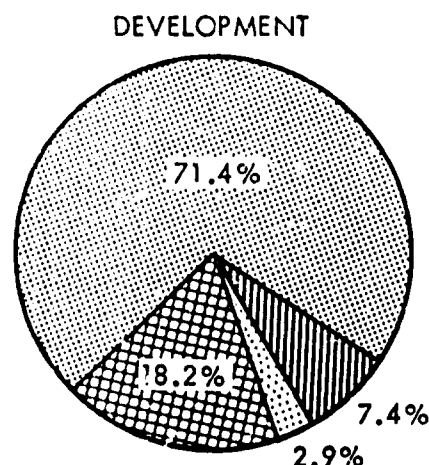
Advanced-degree professionals tend to be the majority of those performing research, from 47.9 percent in the Army to 58.2 percent in the Air Force. No-degree and B.S. professionals dominate the development and test and evaluation functional areas.

(DISTRIBUTION IN %)

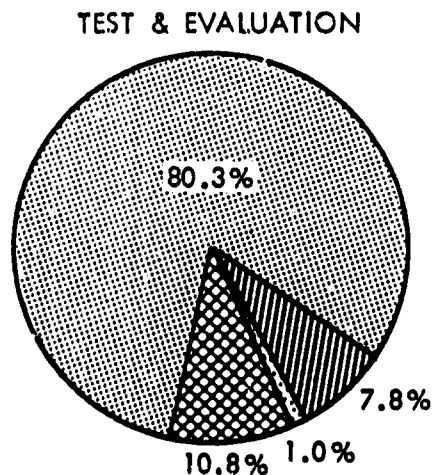
|           | Army | Navy | Air Force | DoD  |
|-----------|------|------|-----------|------|
| No degree | 5.1% | 1.4% | 3.0%      | 2.7% |
| B.S.      | 49.1 | 45.8 | 38.8      | 46.0 |
| M.S.      | 24.0 | 28.8 | 29.6      | 26.0 |
| Ph.D.     | 21.7 | 23.5 | 28.2      | 23.5 |
| Medical   | 1.2  | 0.5  | 0.4       | 0.3  |



|           | Army | Navy | Air Force | DoD  |
|-----------|------|------|-----------|------|
| No degree | 9.0% | 5.5% | 8.6%      | 7.4% |
| B.S.      | 71.7 | 70.3 | 72.9      | 71.4 |
| M.S.      | 16.3 | 21.2 | 15.5      | 18.2 |
| Ph.D.     | 2.9  | 2.9  | 2.9       | 2.9  |
| Medical   | 0.1  | 0.1  | 0.1       | 0.1  |

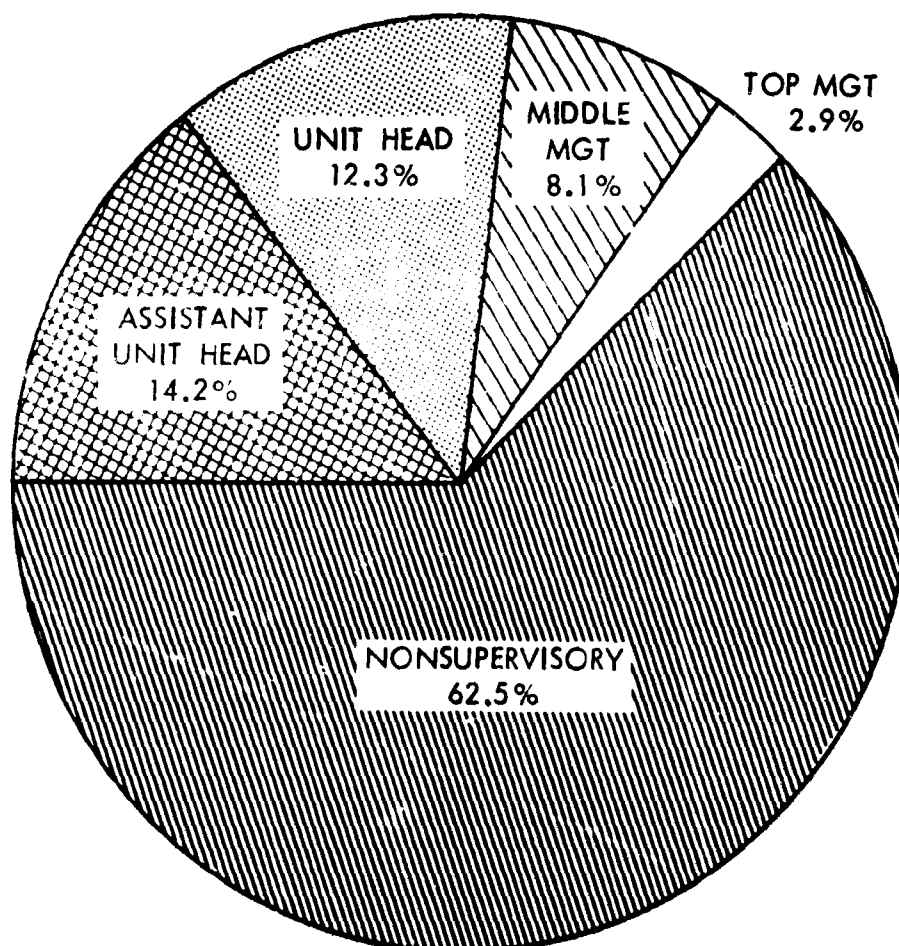


|           | Army | Navy | Air Force | DoD  |
|-----------|------|------|-----------|------|
| No degree | 9.0% | 6.7% | 7.3%      | 7.8% |
| B.S.      | 80.5 | 82.1 | 75.2      | 80.3 |
| M.S.      | 9.2  | 10.2 | 16.2      | 10.8 |
| Ph.D.     | 1.1  | 0.9  | 1.2       | 1.0  |
| Medical   | 0.3  | 0.0  | 0.1       | 0.1  |



### SUPERVISORY LEVELS

The Army has the highest percentage of supervisory personnel (42.2 percent), and the Navy, the lowest (33.7 percent). The Army exceeds the other Services in each level of supervision.

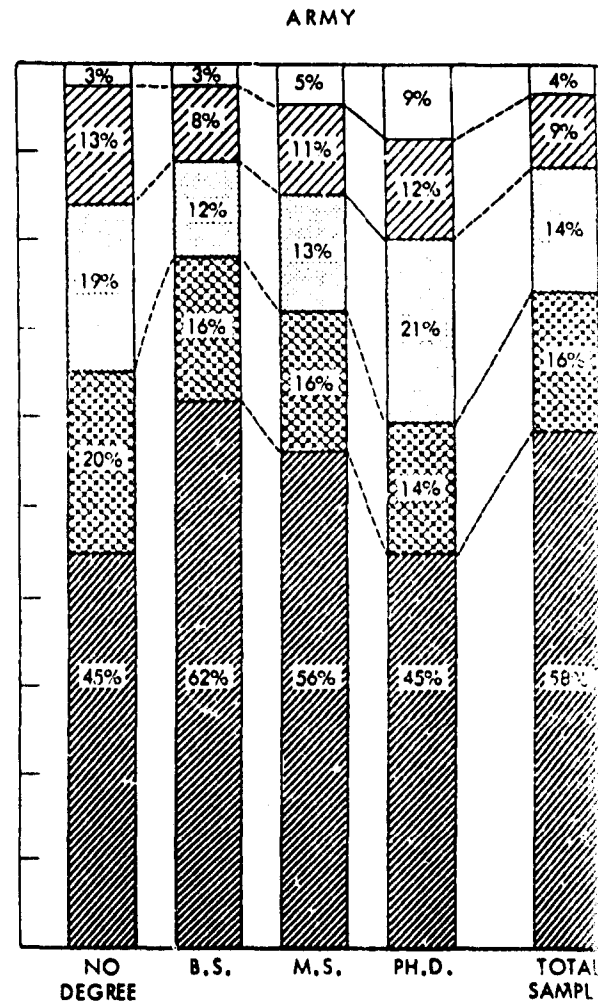
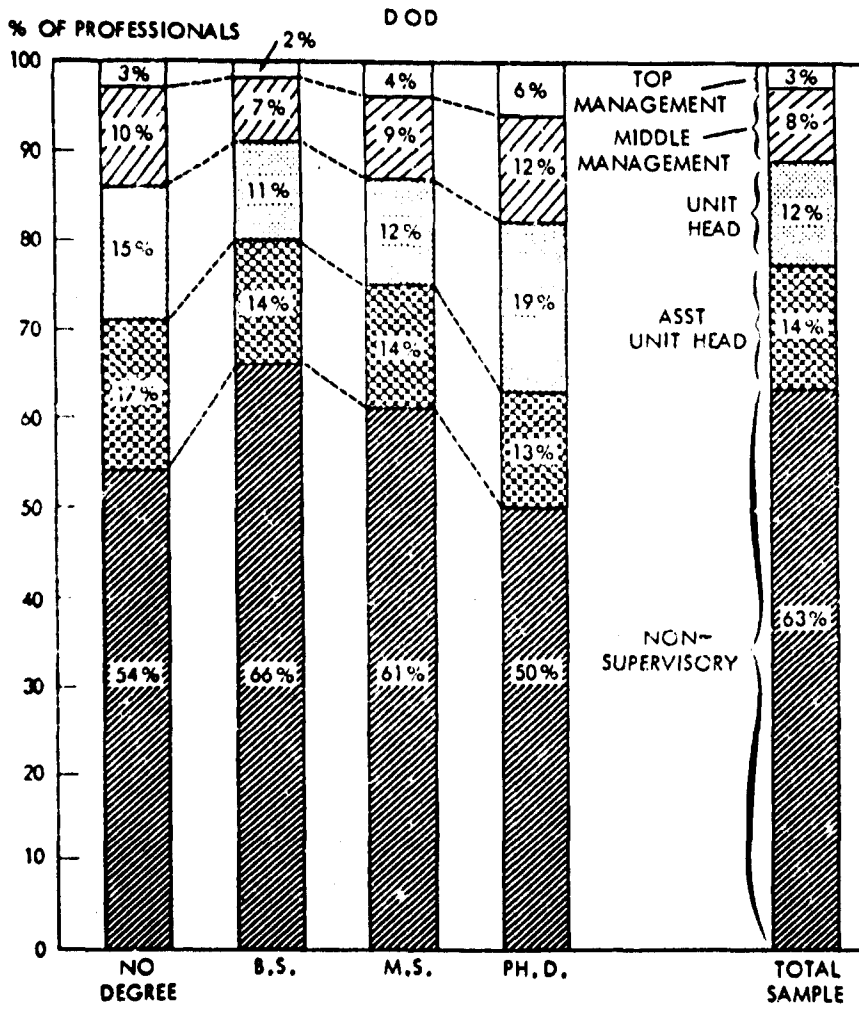


| Level of Supervision | Army | Navy | Air Force | DoD  |
|----------------------|------|------|-----------|------|
| Nonsupervisory       | 57.8 | 66.3 | 64.2      | 62.5 |
| Assistant Unit Head  | 15.7 | 13.0 | 13.7      | 14.2 |
| Unit Head            | 13.7 | 11.1 | 11.6      | 12.3 |
| Middle Management    | 9.0  | 7.8  | 7.0       | 8.1  |
| Top Management       | 3.7  | 1.8  | 3.5       | 2.9  |

Notes: Assistant unit head--primarily technical supervision.  
Unit head--lowest level for hire/fire recommendation and preparation of performance ratings, etc.  
Middle management--administration and direction of several units.  
Top management--staff and policy-making personnel.

**SUPERVISORY**

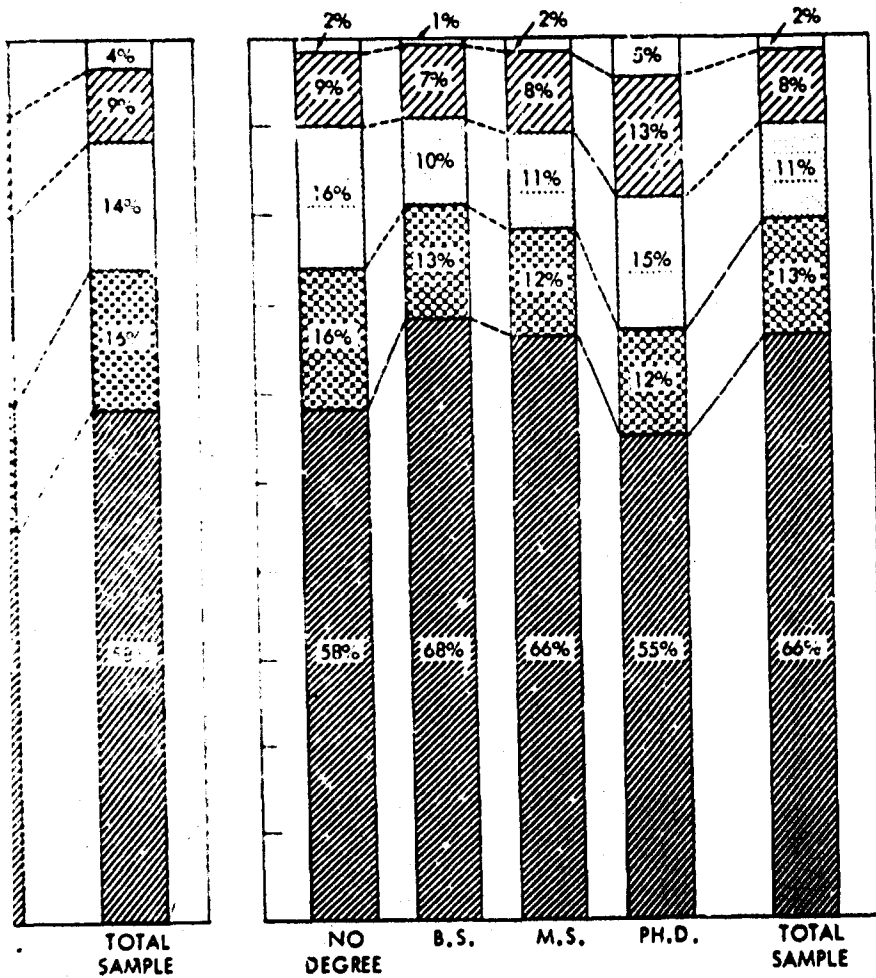
There are significant differences in supervisory professionals at the doctorate level in the Army, of those with doctorates hold supervisory positions. Force's doctorate personnel are supervisors.



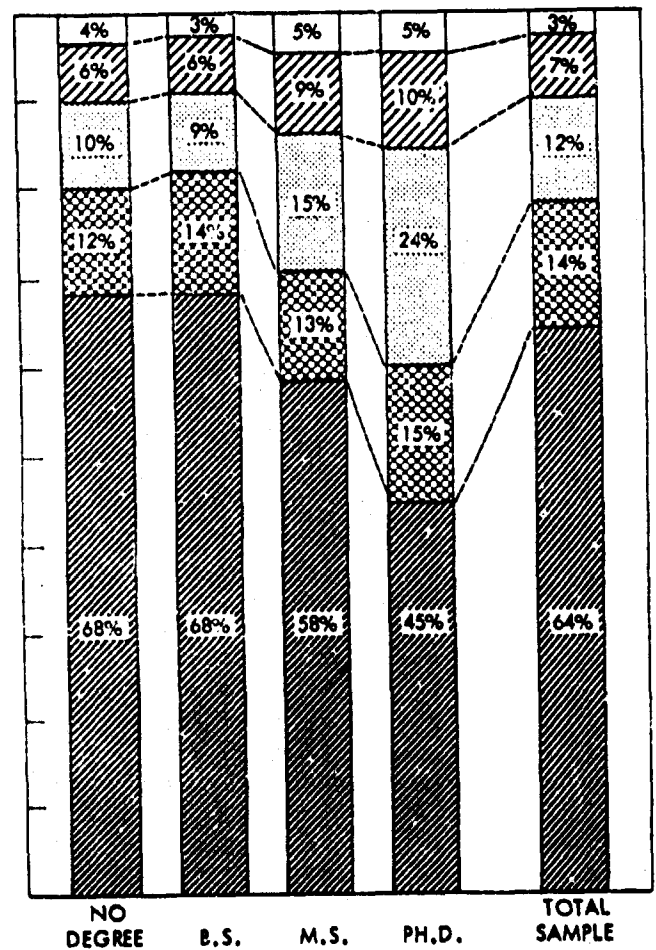
# SUPERVISORY LEVELS (continued)

ces in supervisory levels with regard to degree. Of the no-degree  
l in the Army, 55 percent are supervisors. In the Navy, 45 percent  
visory positions. As in the case of the Army, 55 percent of the Air  
rvisors.

NAVY

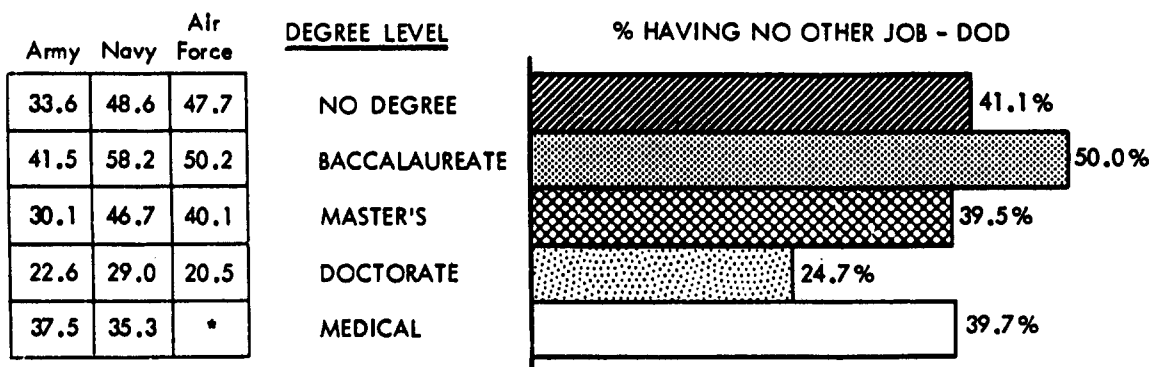
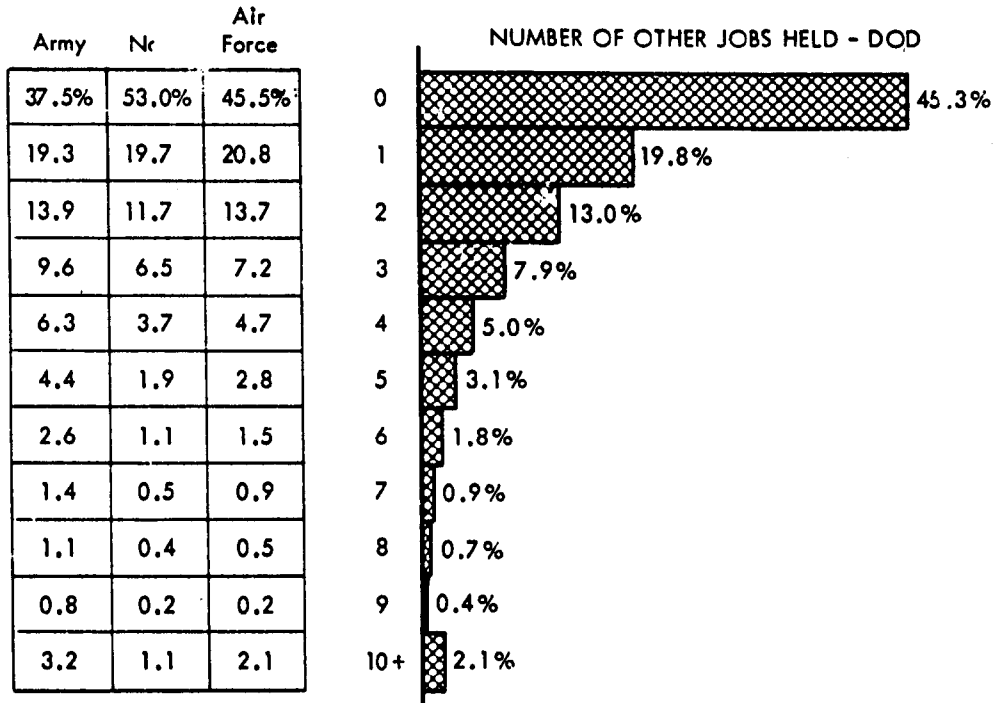


AIR FORCE



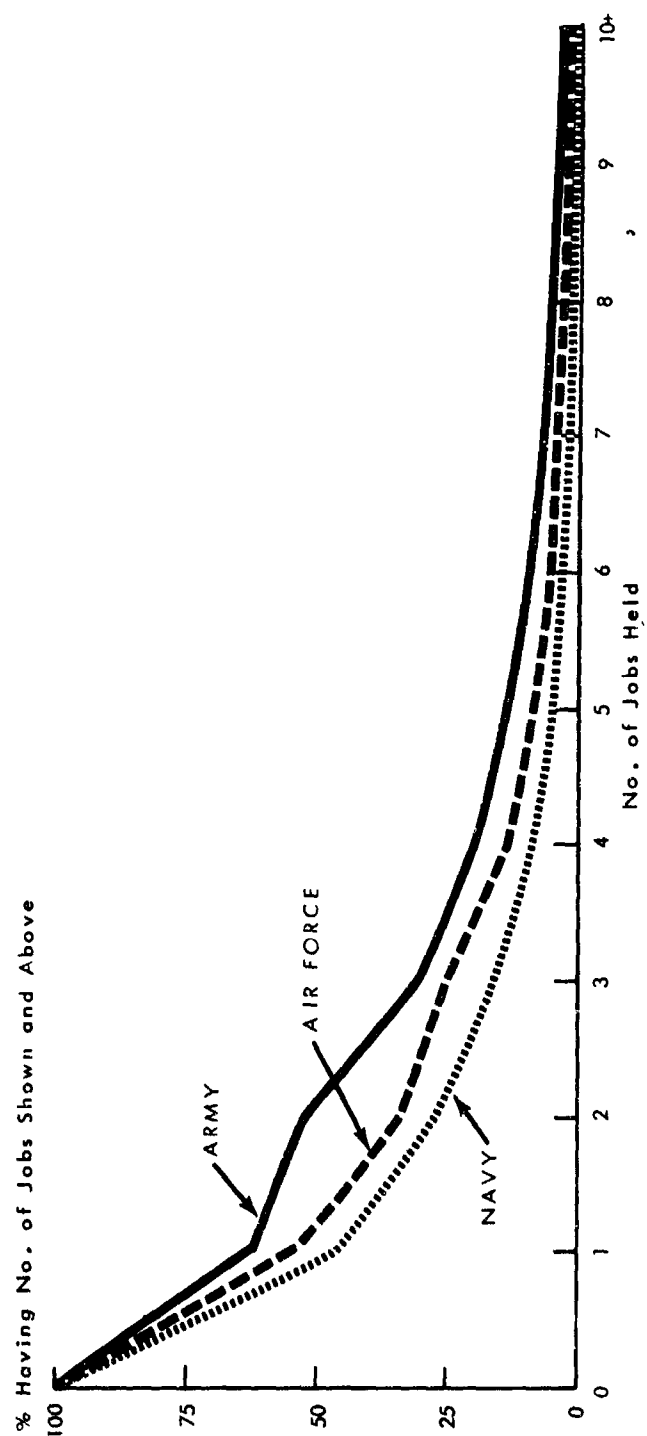
## JOB MOBILITY

Almost half of the S&Es in the survey have worked for no employer other than their current DoD component or activity. This ranged from the Army's 37.5 percent to the Navy's 53.0 percent. The Army subset shows the greatest mobility; 52.3 percent of its professionals have had two or more jobs. This is significantly greater than the Navy and the Air Force, in which 27.1 percent and 33.6 percent, respectively, have held two or more jobs.



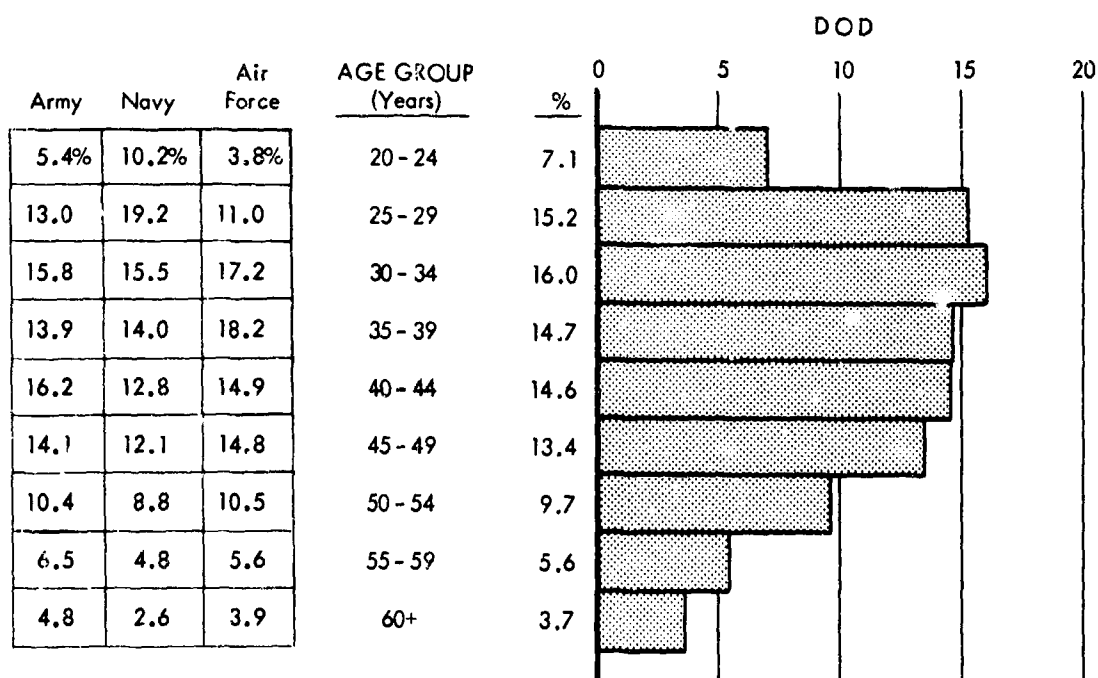
\* Less than 13 Professionals

# JOB MOBILITY (continued)

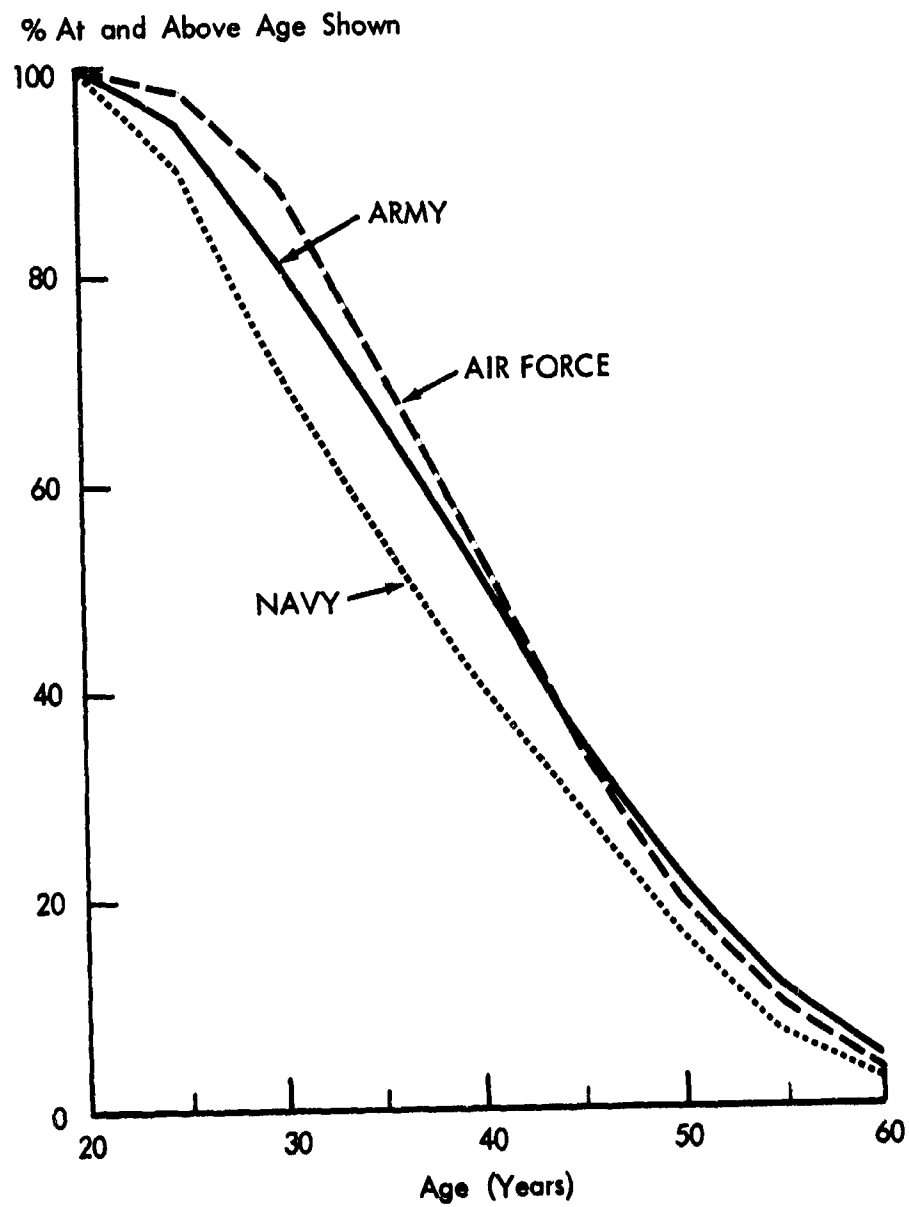


## AGE

Of the S&Es surveyed, 53 percent are below age 40, and 9.3 percent are 55 or older. The Navy has the youngest population, with 59.3 percent at and below age 40. Its median age is 37 years, while the Army's is 40 years and the Air Force's is 41.



AGE (continued)

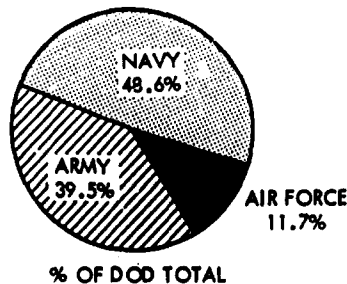
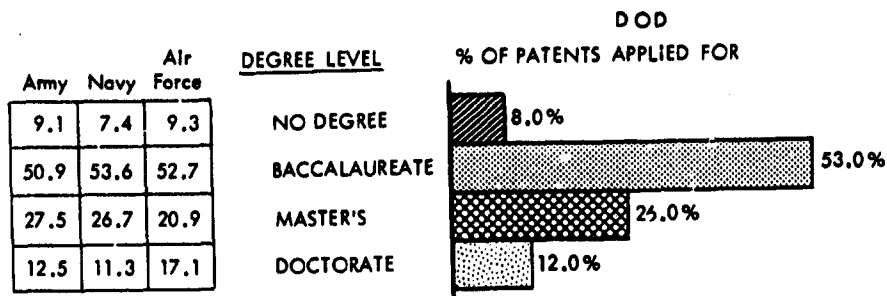
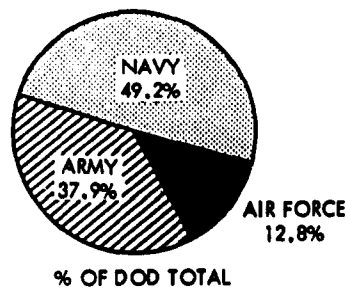
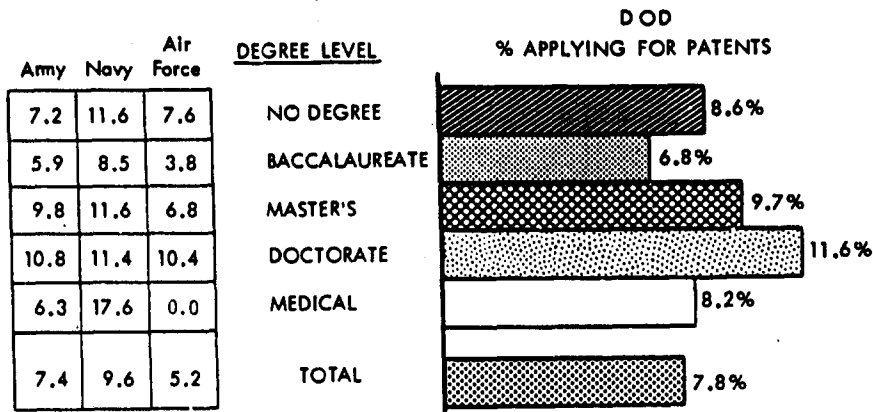




## PATENT APPLICATIONS

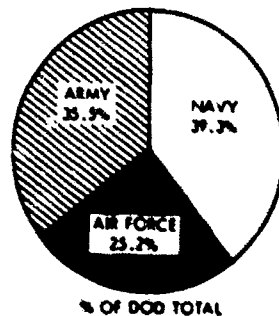
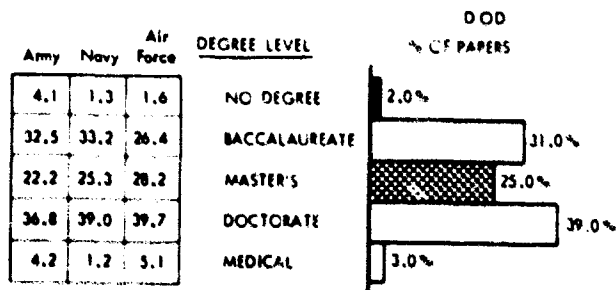
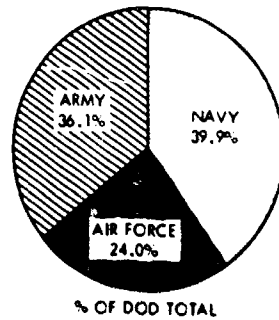
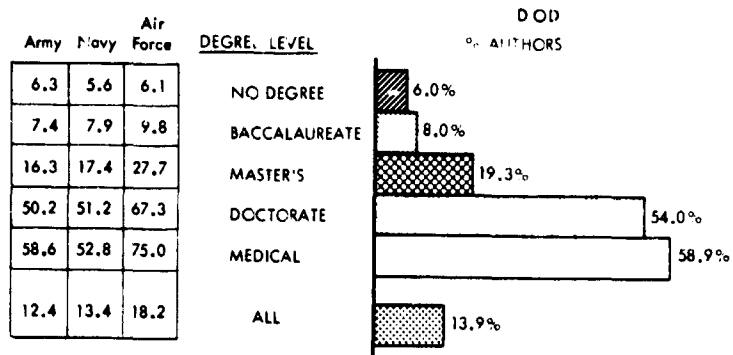
Holders of advanced degrees are more likely to apply for patents than baccalaureate-degree holders. The Navy, with 41.1 percent of the survey sample, has applied for 48.6 percent of the survey's patent applications. The Air Force, with 18.5 percent of the survey, applied for only 11.7 percent of the survey's patent applications.

(DISTRIBUTION IN %)



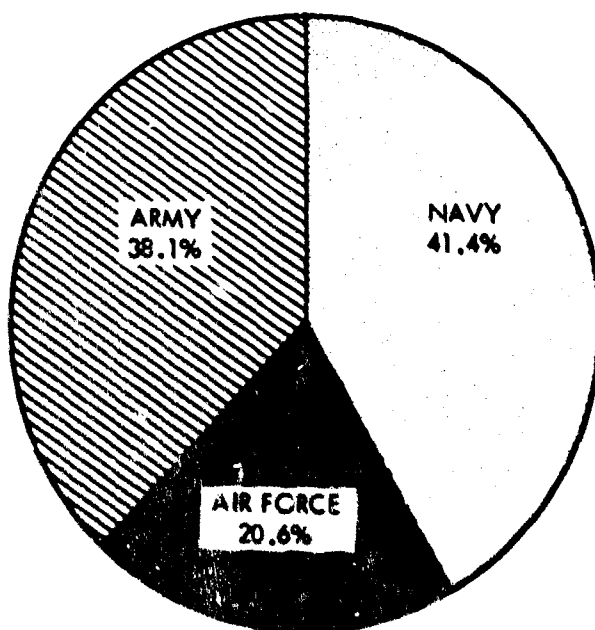
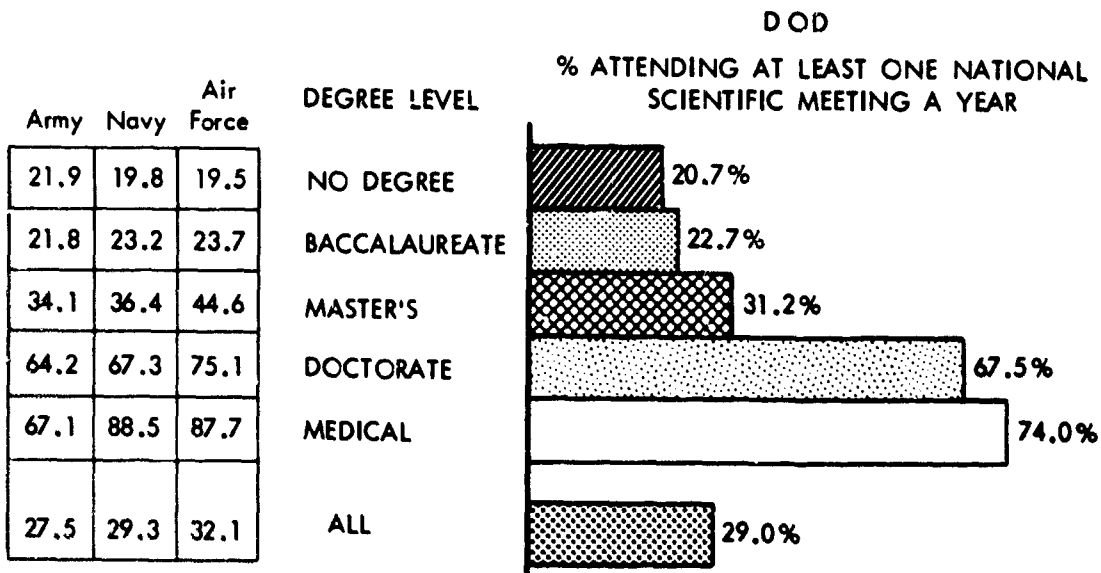
## PAPERS PUBLISHED

Of the Defense S&E personnel surveyed, 13.9 percent were authors of at least one published paper. The range was from 12.4 percent for the Army to 18.2 percent for the Air Force. In all cases, doctorate professionals published more papers than all others. Relative to its sample size, the Air Force tends to publish more than the other two Departments.



## ATTENDANCE AT NATIONAL SCIENTIFIC MEETINGS

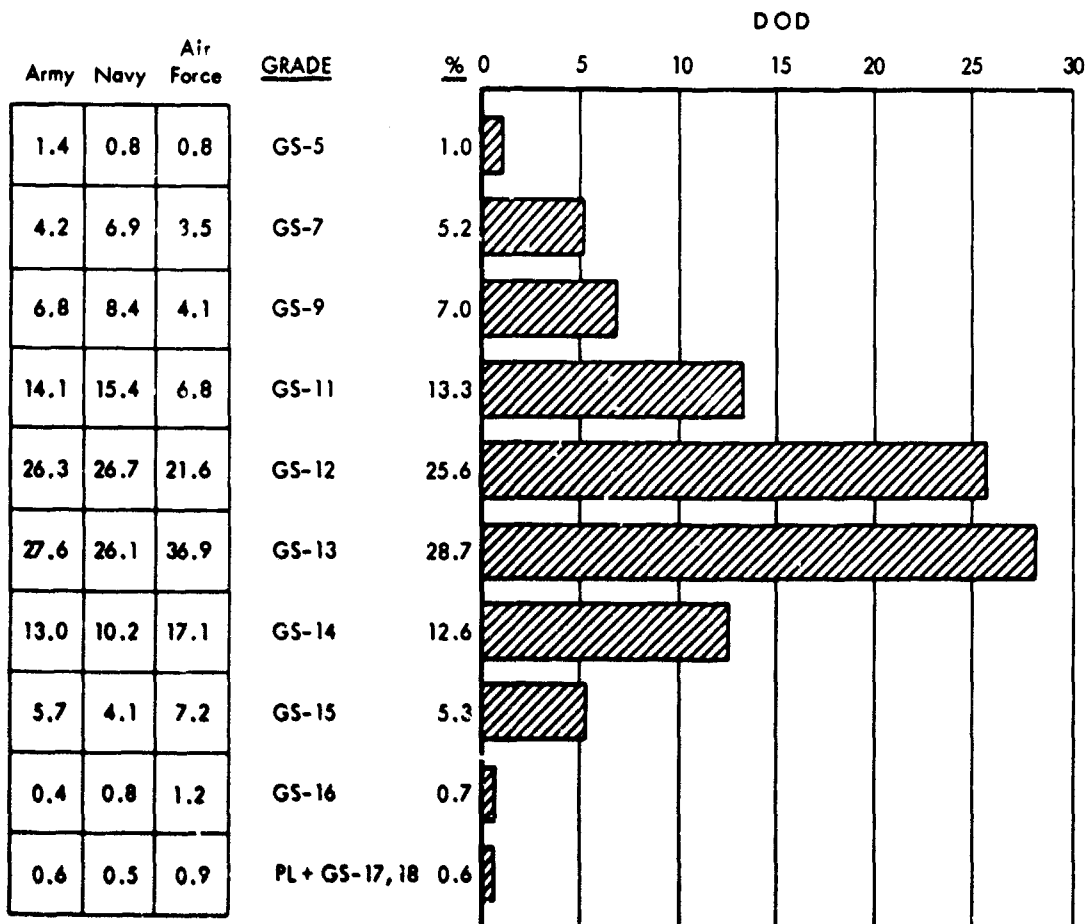
About one scientist or engineer in four attends a national meeting of a technical or scientific society each year. Two out of every three holders of doctorates attend such meetings. The Air Force is above the DoD average in attendance, and the Army is the lowest. This appears to correlate closely with papers published.



% OF DOD TOTAL

## GRADE DISTRIBUTIONS

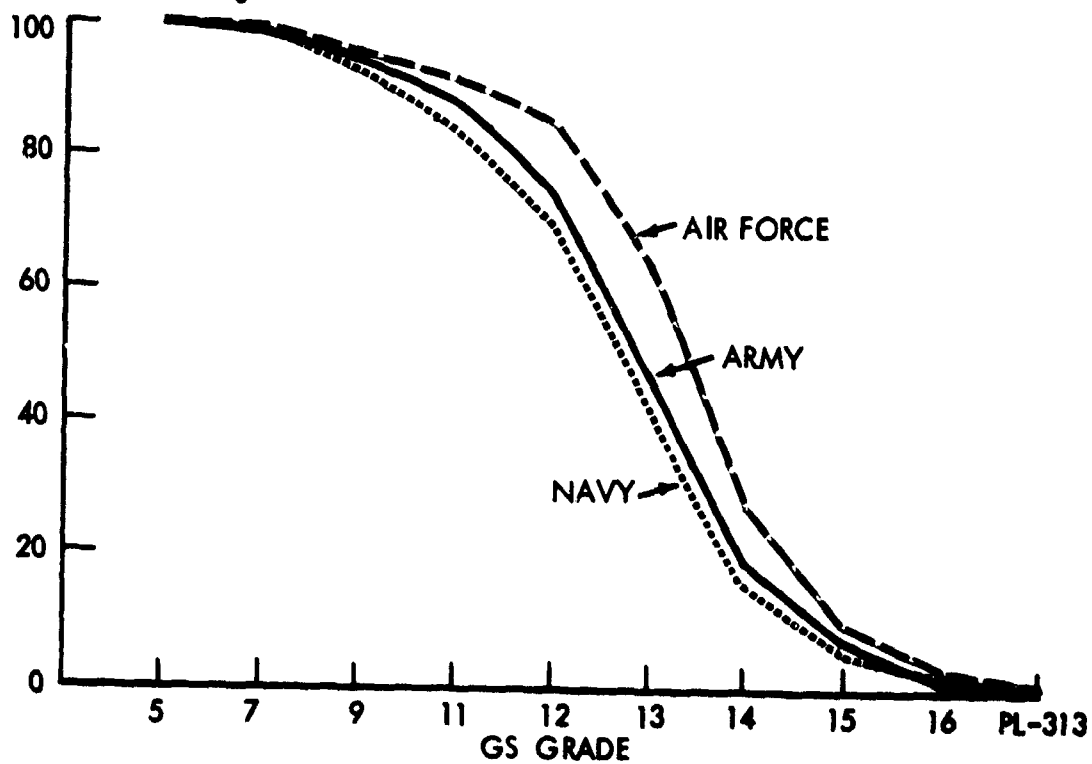
Overall, more than 50 percent of the survey sample is at or below grade GS-12. Over half are GS-12s and GS-13s; about one-fifth are at GS-14 and above. The Air Force has the highest grade level, with 63.3 percent at and above GS-13, compared to the Army and the Navy with 47.3 percent and 41.7 percent, respectively.



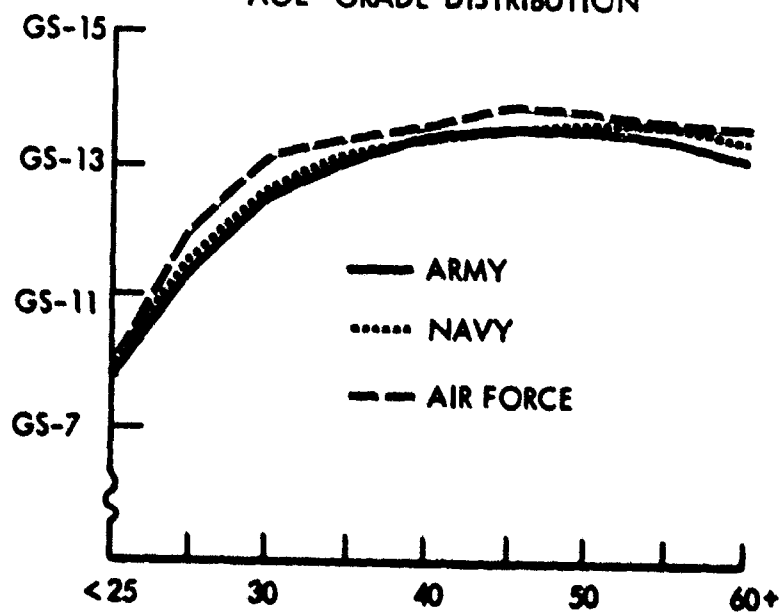
# GRADE DISTRIBUTIONS (continued)

## CUMULATIVE GRADE DISTRIBUTION

% at and above grade shown



## AGE-GRADE DISTRIBUTION



# GRADE—DEGREE LEVEL

Over 50 percent of the PL-313s have doctorates, and more than 40 percent have advanced degrees. At and above GS-15, over 40 percent have advanced degrees. The percentages of advanced degrees show an opposite trend with rising grade level. B.S.-degree holders show an opposite trend with rising grade level. B.S.-degree holders show an opposite trend with rising grade level. B.S.-degree holders show an opposite trend with rising grade level.

| ARMY |      |      |       |      | NAVY |      |      |       |      | AIR FORCE |      |      |       |      |
|------|------|------|-------|------|------|------|------|-------|------|-----------|------|------|-------|------|
| None | BS   | MS   | Ph.D. | Med. | None | BS   | MS   | Ph.D. | Med. | None      | BS   | MS   | Ph.D. | Med. |
| 5.0  | 15.0 | 15.0 | 53.3  | 11.7 | —    | 22.9 | 16.7 | 53.0  | 8.3  | —         | 23.9 | 4.3  | 71.7  | —    |
| —    | 41.0 | 20.5 | 33.3  | 5.1  | 3.4  | 26.4 | 24.1 | 43.7  | 2.3  | 1.7       | 28.3 | 36.7 | 31.7  | 1.7  |
| 4.0  | 50.2 | 21.4 | 22.8  | 1.7  | 2.2  | 42.2 | 26.7 | 28.4  | 0.4  | 3.7       | 41.3 | 27.5 | 26.1  | 1.4  |
| 8.7  | 54.9 | 21.1 | 14.9  | 0.4  | 4.6  | 51.0 | 26.3 | 18.0  | 0.1  | 7.0       | 51.2 | 25.0 | 16.6  | 0.2  |
| 9.5  | 63.0 | 18.5 | 8.5   | 0.4  | 5.2  | 62.1 | 23.0 | 9.6   | 0.1  | 7.3       | 66.5 | 19.9 | 6.3   | —    |
| 9.3  | 69.1 | 15.4 | 6.0   | 0.1  | 6.1  | 67.7 | 20.4 | 5.7   | 0.1  | 10.2      | 73.9 | 12.7 | 3.1   | —    |
| 6.0  | 73.9 | 18.1 | 1.8   | 0.3  | 5.6  | 70.7 | 22.9 | 0.8   | 0.1  | 4.2       | 73.4 | 22.1 | 0.3   | —    |
| 3.1  | 81.7 | 15.0 | 0.1   | —    | 1.6  | 76.7 | 21.3 | 0.2   | 0.1  | 5.5       | 79.4 | 14.6 | 0.5   | —    |
| 1.3  | 91.5 | 7.0  | —     | 0.2  | 1.2  | 93.4 | 5.4  | —     | —    | 0.6       | 95.3 | 4.1  | —     | —    |
| —    | 98.7 | —    | —     | 1.3  | 1.1  | 97.8 | 1.1  | —     | —    | 8.1       | 89.2 | 2.7  | —     | —    |

①

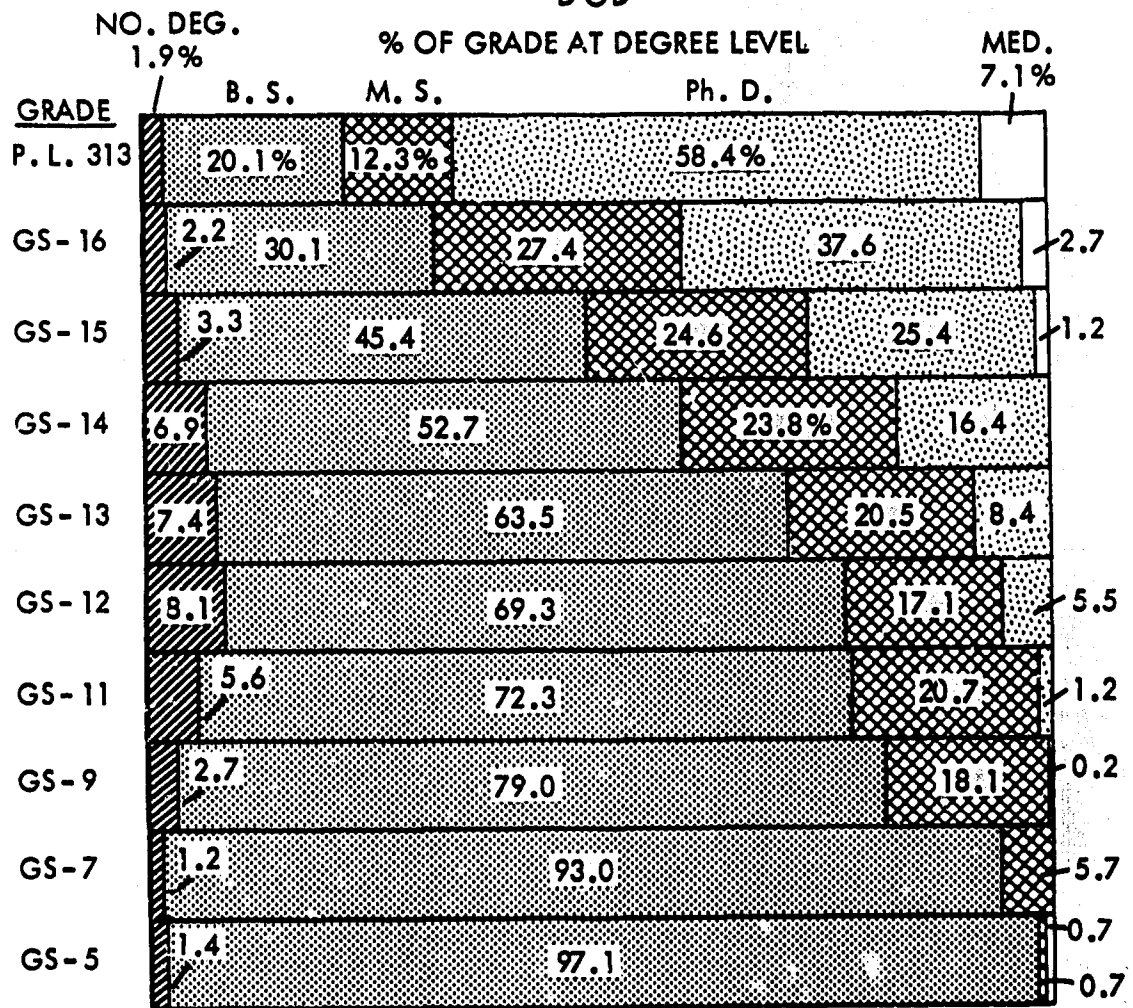
# GRADE—DEGREE LEVEL

3s have doctorates, and more than 75 percent have advanced degrees. nt have advanced degrees. The percentages of doctorates increases gree holders show an opposite trend, while holders of Master's ver practically the whole age spectrum.

## AIR FORCE

|   | BS   | MS   | Ph.D. | Med. |
|---|------|------|-------|------|
| 3 | 23.9 | 4.3  | 71.7  | -    |
| 7 | 28.3 | 36.7 | 31.7  | 1.7  |
| 7 | 41.3 | 27.5 | 26.1  | 1.4  |
| 0 | 51.2 | 25.0 | 16.6  | 0.2  |
| 3 | 66.5 | 19.9 | 6.3   | -    |
| 2 | 73.9 | 12.7 | 3.1   | -    |
| 2 | 73.4 | 22.1 | 0.3   | -    |
| 5 | 79.4 | 14.6 | 0.5   | -    |
| 6 | 95.3 | 4.1  | -     | -    |
| 1 | 89.2 | 2.7  | -     | -    |

## DOD

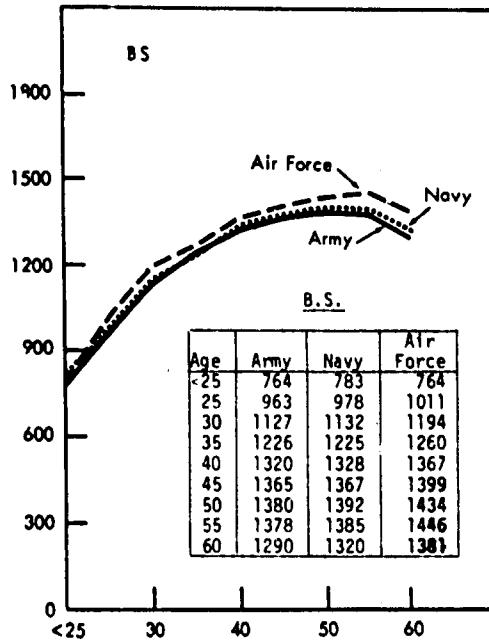


2

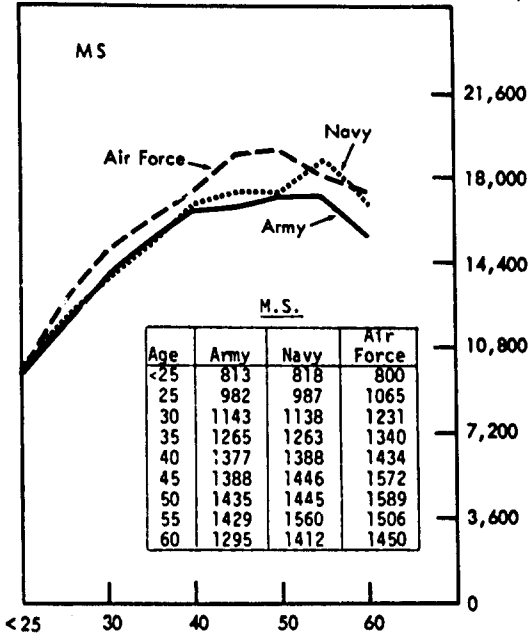
## MEDIAN SALARIES

The median salary of personnel with M.S. degrees is 6.5 percent greater than that of holders of B.S. degrees. The salaries of Ph.D.'s exceed B.S. salaries by 23.5 percent. Salaries increase with age at least up to 50 years. The Air Force pays higher salaries at all degree levels and in practically all age groups.

Monthly Salary

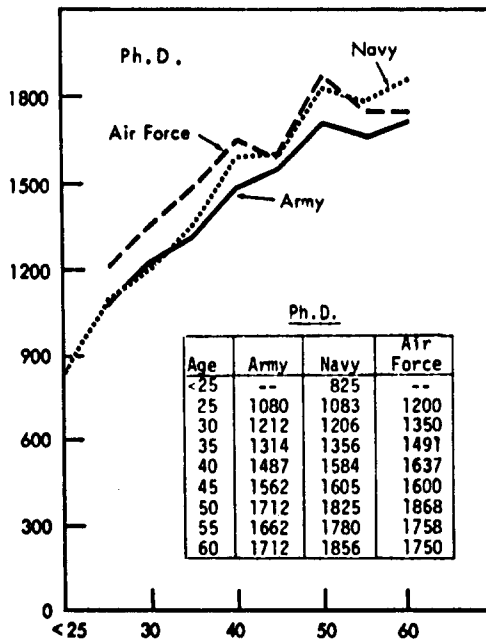


Annual Salary

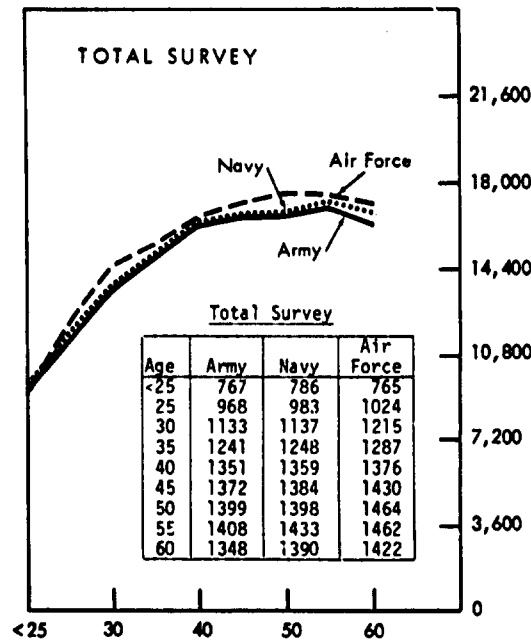


Age (Years)

Monthly Salary



Annual Salary



Age (Years)



## MEDIAN SALARIES (continued)

B.S. and M.S. degrees—Engineers receive higher salaries in the Army and the Air Force than people in other disciplines. In the Navy, chemists get the highest compensation.

Ph.D. degrees—Mathematicians receive the highest median salary of all disciplines compared.

The higher the degree level, the higher the median salary is in all disciplines compared.

MEDIAN SALARY FOR VARIOUS DISCIPLINES  
DCD CIVILIAN PROFESSIONALS

